

WHAT IS CLAIMED IS:

1. A method implemented in a mobile radio terminal for reducing signaling associated with the mobile radio terminal selecting a new geographic coverage area, comprising:

5 receiving from a radio access network information indicating a list of one or more geographic coverage areas from which the mobile radio terminal may or may not obtain service;

checking the received information when considering whether to request service from a new geographic coverage area; and

10 determining whether to select a geographic coverage area depending on the received information.

2. The method in claim 1, wherein the geographic coverage area is a location area, and wherein the information is received in a location area update accept messages in response to a location area update request message sent by the mobile terminal to the radio access network.

3. The method in claim 1, wherein the geographic coverage area is a location area, and wherein the information is received in a location area update rejection message in response to a location area update request message sent by the mobile terminal to the radio access network.

20 4. The method in claim 1, further comprising:
receiving updated information from the radio access network.

5. The method in claim 1, further comprising:
storing the list of one or more geographic coverage areas;
checking the stored list prior to performing a subsequent geographic coverage area

25 update; and

determining whether to perform a location area update procedure based on the checked list.

6. The method in claim 1, wherein the radio access network is shared by first and second operators and the information indicates one or more geographic coverage areas belonging to one of the operators that does not provide service to the mobile radio terminal.

5 7. The method in claim 6, further comprising:
selecting a geographic coverage area belonging to the other of the operators.

8. The method in claim 1, wherein the geographic coverage area is a location area and the information includes a list of forbidden location areas for the mobile terminal, and wherein the mobile terminal does not perform a location area update for forbidden location areas on the list.

9. The method in claim 8, wherein the mobile terminal does not select cells in location areas that are on the list.

10. A method implemented in a cellular communications system including a radio access network for serving plural geographic coverage areas, comprising:
15 receiving a message from a mobile radio terminal, and
sending to the mobile radio terminal information indicating a list of the geographic coverage areas from which the mobile radio terminal may or may not request service.

11. The method in claim 10, wherein the mobile terminal uses the information to determine whether to perform a geographic coverage area update procedure.

20 12. The method in claim 10, wherein the mobile terminal uses the information to determine whether to select a geographic coverage area.

13. The method in claim 10, further comprising:
sending the information in a geographic coverage area update accept message in response to a geographic coverage area update request message sent by the mobile
25 terminal.

14. The method in claim 13, further comprising:
updating the information in a subsequent geographic coverage area update message
sent to the mobile terminal.

15. The method in claim 10, further comprising:
5 sending the information in a geographic coverage area update reject message in
response to a first coverage area update request message sent by the mobile terminal.

16. The method in claim 10, wherein the radio access network is shared by first
and second operators and the information indicates one or more geographic coverage
areas belonging to one of the operators that does not provide service to the mobile radio
terminal.

17. The method in claim 10, wherein the geographic coverage area is a location
area, the method further comprising:
determining one or more groups identifying certain mobile terminals;
formulating a list of location areas corresponding to each of the groups; and
15 in response to the message received from the mobile terminal, forwarding one of
the lists of location areas to the mobile terminal depending upon the group to which the
mobile terminal belongs.

18. The method in claim 17, wherein the determining, formulating, and
forwarding are performed in a core network coupled to the radio access network.

20 19. The method in claim 17, wherein each group represents mobile terminals
belonging to a network operator.

20. The method in claim 17, wherein each group represents mobile terminals
belonging to a mobile subscriber group.

21. The method in claim 17, further comprising:
25 determining an identifier associated with the mobile terminal;
analyzing the mobile terminal identifier to determine the group to which the mobile
terminal belongs; and

sending the list of location areas corresponding to the determined group in response to the message received from the mobile terminal.

22. The method in claim 10, wherein the information is sent from a core network to the radio access network.

5 23. A location updating message transmitted from a radio access network over a radio interface to a mobile radio terminal, comprising:

a location updating message type field;

a location area identification field;

a mobile terminal identification field; and

10 a location area field indicating location areas that the mobile terminal may or may not select.

24. The location updating message format in claim 23, wherein the message is a location updating accept message.

15 25. The location updating message format in claim 23, wherein the message is a location updating reject message.

26. A location updating message transmitted from a mobile radio terminal to a radio access network over a radio interface, comprising:

a location updating message type field;

a mobile terminal identification field; and

20 a location area list indicator field indicating whether a location area list associated with the mobile terminal is requested to be sent to the mobile terminal.

27. A method for use in a cellular radio communications system including a core network coupled to a radio access network communicating information with mobile radio terminals over a radio interface, comprising:

25 storing a list of forbidden location areas for a group of mobile terminals;

receiving a communication from one of the mobile terminals in the group;

sending the list of forbidden location areas to the one mobile terminal;

the one mobile terminal receiving and storing the list of forbidden location areas;
and

the one mobile terminal checking the list of forbidden location areas before
selecting a location area.

5 28. The method in claim 27, wherein the one mobile terminal does not select a
cell in a location area that is on the list of forbidden location areas.

29. The method in claim 27, wherein the one mobile terminal does not perform
a location area update operation for a location area that is on the list of forbidden location
areas.

10 30. The method in claim 27, wherein the radio access network is shared by first
and second operators and the list of forbidden location areas indicates one or more
location areas belonging to one of the operators that does not provide service to the
mobile radio terminal

15 31. The method in claim 27, wherein the list is sent in response to a first
location update message sent by the one mobile terminal after the mobile terminal powers
up.

20 32. Apparatus for use in mobile radio terminal, comprising:
radio transceiving circuitry configured to receive from a radio access network
information indicating a list of one or more geographic coverage areas from which the
mobile radio terminal may or may not obtain service, and
electronic circuitry configured to perform the following tasks:
 check the received information when considering whether to request service
 from a new geographic coverage area, and
 determine whether to select a geographic coverage area depending on the
25 received information.

33. The apparatus in claim 32, wherein the geographic coverage area is a
location area, and the information is received in a location area update accept message in

response to a first location area update request message sent by the mobile terminal to the radio access network.

34. The apparatus in claim 32, wherein the geographic coverage area is a location area, and wherein the information is received in a location area update rejection
5 message in response to a location area update request message sent by the mobile terminal to the radio access network.

35. The apparatus in claim 32, wherein the electronic circuitry is further configured to store the list of one or more geographic coverage areas, to check the stored list prior to performing a subsequent geographic coverage area update, and to determine
10 whether to perform a location area update based on the checked list.

36. The apparatus in claim 35, wherein the radio access network is shared by first and second operators and the information indicates one or more geographic coverage areas belonging to one of the operators that does not provide service to the mobile radio terminal, and wherein the electronic circuitry is further configured to select a geographic
5 coverage area belonging to the other of the operators.

37. The apparatus in claim 35, wherein the geographic coverage area is a location area and the information includes a list of forbidden location areas for the mobile terminal.

38. The apparatus in claim 37, wherein the electronic circuitry is further
20 configured to not select a cell in a location area that is on the list of forbidden location areas.

39. The apparatus in claim 37, wherein the electronic circuitry is further configured to not perform a location area update procedure for a location area that is on the list of forbidden location areas.

25 40. Radio access network apparatus for use in a cellular communications system including a radio access network serving plural geographic coverage areas, comprising:

radio transceiving circuitry configured to receive a message from a mobile radio terminal, and

data processing circuitry configured to provide information indicating a list of geographic coverage areas from which the mobile radio terminal may or may not request service.

41. The apparatus in claim 40, wherein the mobile terminal uses the information to determine whether to perform a location update procedure and whether to select a geographic coverage area.

42. The apparatus in claim 40, wherein the data processing circuitry is configured to provide the information in a geographic coverage area update accept message in response to an initial geographic coverage area update request message sent by the mobile terminal.

43. The apparatus in claim 40, wherein the data processing circuitry is configured to provide the information in a geographic coverage area update reject message in response to a geographic coverage area update request message sent by the mobile terminal.

44. The apparatus in claim 40, wherein the radio access network is shared by first and second operators and the information indicates one or more geographic coverage areas belonging to one of the operators that does not provide service to the mobile radio terminal.

45. The apparatus in claim 40, wherein the geographic coverage area is a location area and the data processing circuitry is configured to determine one or more groups identifying certain mobile terminals, formulate a list of location areas corresponding to each of the groups, and forward the list of location areas to a mobile terminal depending upon the group to which the mobile terminal belongs.

46. The apparatus in claim 45, wherein the electronic circuitry for performing the determining, formulating, and forwarding tasks is located in a core network coupled to the radio access network.

47. The apparatus in claim 45, wherein each group represents mobile terminals
5 belonging to a network operator.

48. The apparatus in claim 45, wherein each group represents mobile terminals belonging to a mobile subscriber group.

49. The apparatus in claim 45, wherein the data processing circuitry is
configured to determine an identifier associated with the mobile terminal, analyze the
mobile terminal identifier to determine the group to which the mobile terminal belongs,
10 and provide the list of location areas corresponding to the determined group in response
to the message received from the mobile terminal.